

FIGURE 1. Nucleotide and deduced amino acid sequences of HPV18 L1.

10            20            30            40            50            60 ATGGCTTTGGCGGCCTAGTGACAATACCGTATACTACCTCCACCTCCTCTGTGGCAAGA 1 M A L W R P S D N T V Y L P P P S V A R	20 H1V18 1
70            80            90            100          110          120 GTTGTAATACTGATTATGTGACTCGACAAGCATATTTATCATGTCGGCAGCTCT 21 V V N T D D Y V T R T S I F Y H A G S S	40
130          140          150          160          170          180 AGATTATTAACTGTTGGTAAATCCATATTTAGGGTCTGCAGGTGGCAATAAGCAG 41 R L L T V G N P Y F R V P A G G G N K Q	60
190          200          210          220          230          240 GATATTCTAACGGTTCTGCATACCAATATAGAGTATTCGGGTGCAGTTACCTGACCCA 61 D I P K V S A Y Q Y R V F R V Q L P D P	80
250          260          270          280          290          300 AATAAAATTGGTTTACCTGATAATAGTATTTATAATCCTGAAACACAACGTTAGTGTGG 81 N K F G L P D N S I Y N P E T Q R L V W	100
310          320          330          340          350          360 GCCTGTGCTGGAGTGGAAATTGGCCGTGGTCAGCCTTAGGTGTTGGCCTTAGTGGGCAT 101 A C A G V E I G R G Q P L G V G L S G H	120
370          380          390          400          410          420 CCATTTTATAATAAAATTAGATGACACTGAAAGTCCCCATGCCGCTACGTCTAAATGTTCT 121 P F Y N K L D D T E S S H A A T S N V S	140
430          440          450          460          470          480 GAGGACGTTAGGGACAATGTGCTGTAGATTATAAGCAGACACAGTTATGTATTTGGCC 141 E D V R D N V S V D Y K Q T Q L C I L G	160
490          500          510          520          530          540 TGTGCCCTGCTATTGGGAACACTGGCTAAAGGCACTGTTGTAATCGCTCCCTTA 161 C A P A I G E H W A K G T A C K S R P L	180
550          560          570          580          590          600 TCACAGGGCGATTGCCCCCTTAGAACTTAAGAACACAGTTTGGAAAGATGGTGTATG 181 S Q G D C P P L E L K N T V L E D G D M	200
610          620          630          640          650          660 GTAGATACTGGATATGGGCCATGGACTTTAGTACATTGCAAGATACTAAATGTGAGGTA 201 V D T G Y G A M D F S T L Q D T K C E V	220
670          680          690          700          710          720 CCATTGGATATTGTCAGCTATTGTAATATCCTGATTATTACAAATGTCCTCCAGAT 221 P L D I C Q S I C K Y P D Y L Q M S A D	240
730          740          750          760          770          780 CCTTATGGGATTCATGTTTCTACGACGTGAGCAGCTTTGCTAGGCATTIT 241 P Y G D S M F F C L R R E Q L F A R H F	260
790          800          810          820          830          840 TGGAAATAGGGCAGGTACTATGGGTGACACTGTGCCTCAATCCTTATATATTAAAGGCACA 261 W N R A G T M G D T V P Q S L Y I K G T	280
850          860          870          880          890          900 GGTATGCGTGTCTCACCTGGCAGCTGTGTGTATTCTCCCTCTCCAAGTGGCTCTATTGTT 281 G M R A S P G S C V Y S P S P S G S I V	300
910          920          930          940          950          960 ACCTCTGACTCCCAGTTGTTAATAACCATATTGGTACATAAGGCACAGGGTCATAAC 301 T S D S Q L F N K P Y W L H K A Q G H N	320

FIGURE 1 (CONTINUED)

970 AATGGTATCTGCTGGCATAATTCAATTATTTGTACTGTGGTAGATACCACTCGTAGTACC 321 N G I C W H N Q L F V T V V D T T R S T	1000 1020 340 H <sup>PV18</sup>
1030 1040 1050 1060 1070 1080 AATTTAACATATGTGCTCTACACAGTCCTGTACCTGGGAAATATGATGCTACCAAA 341 N L T I C A S T Q S P V P G Q Y D A T K	360 L, 1
1090 1100 1110 1120 1130 1140 TTTAACAGTATAGCAGACATGTTGAAGAATATGATTTGCAAGTTATTTTCAGTTATGT 361 F K Q Y S R H V E E Y D L Q F I F Q L C	380
1150 1160 1170 1180 1190 1200 ACTATTACTTTAACATGCAGATGTTATGTCCTATATTCAAGTATGAATAGCAGTATTTTA 381 T I T L T A D V M S Y I H S M N S S I L	400
1210 1220 1230 1240 1250 1260 GAGGATTGGAACCTTGGTGTCCCCCCCCGCCAACTACTAGTTGGTGGATAACATATCGT 401 E D W N F G V P P P P T T S L V D T Y R	420
1270 1280 1290 1300 1310 1320 TTTGTACAATCTGTTGCTATTACCTGTCAAAAGGATGCTGCCAGCTGAAAATAAGGAT 421 F V Q S V A I T C Q K D A A P A E N K D	440
1330 1340 1350 1360 1370 1380 CCCTATGATAAGTTAAAGTTTGGAAATGTGGATTAAAGGAAAAGTTTCTTGACTTA 441 P Y D K L K F W N V D L K E K F S L D L	460
1390 1400 1410 1420 1430 1440 GATCAATATCCCCTTGGACGTAATTTGGTTCAGGCTGGATTGCGTCGCAAGCCCACC 461 D Q Y P L G R K F L V Q A G L R R K P T	480
1450 1460 1470 1480 1490 1500 ATAGGCCCTCGTAAACGTTCTGCTCCATCTGCCACTACGTCTCTAAACCTGCCAAGCGT 481 I G P R K R S A P S A T T S S K P A K R	500
1510 1520 GTGCGTGTACGTGCCAGGAAGTAA 501 V R V R A R K *	508

FIGURE 2. Amino Acid Variations In L1 Protein Of HPV18

	<u>Amino Acid Position in L1</u>				
	<u>30</u>	<u>88</u>	<u>283</u>	<u>323</u>	<u>338</u>
HPV18 published	P	T	P	V	P
HPV18 Merck	R	N	R	I	R
#354	R	N	R	V	R
#556	R	N	R	V	R
#755	-	-	R	V	R
#697	-	-	R	V	R
#795	-	-	R	V	R
#23	-	-	R	I	R

SOURCES:

HPV18 published: DNA sequence (GenBank accession no. X05015; Cole, S.T. and Danos, O., 1987, J. Mol. Biol. 193: 599-608).

Originally cloned from a cervical carcinoma of a Brazilian patient (Boshart, M., et al., 1984, EMBO J. 3: 1151-1157).

HPV18 Merck: Cloned from cell line SW756 derived from a cervical carcinoma (Freedman, R.S., et al., 1982, In Vitro 18: 719-726). SW756 was established in 1974 from biopsy material collected in Texas.

#354-#795: Clinical specimens collected at Veterans Administration Medical Center, Indianapolis, Indiana.

#23: Clinical specimen collected at Albert Einstein Medical Center, Philadelphia, Pennsylvania.

FIGURE 3. Nucleotide and deduced amino acid sequences of HPV18 L2.

10	20	30	40	50	60	
ATGGTATCCCACCGTGCCGACGACGCAAACGGGCTTCGGTGA						20
1 M V S H R A A R R K R A S V T D L Y K T						
TGTAAACAATCTGGTACATGTCCATCTGATGTTGTTAATAAGGTAGAGGGCACACGTTA						40
21 C K Q S G T C P S D V V N K V E G T T L						
GCAGATAAAAATTGCAATGGTCAAGCCTGGTATATTTGGGTGGACTTGGCATAGGT						60
41 A D K I L Q W S S L G I F L G G L G I G						
ACTGGAAGTGGTACAGGGGTCGTACAGGGTACATTCCATTGGTGGCGTTCCAATACA						80
61 T G S G T G G R T G Y I P L G G R S N T						
GTTGTGGATGTCGGTCCACACGTCTCCAGTGGTATTGAACCTGTGGGCCACAGAC						100
81 V V D V G P T R P P V V I E P V G P T D						
CCATCTATTGTTACATTAATAGAGGACTCAAGTGTGTTACATCAGGTGCACCTAGGCCT						120
101 P S I V T L I E D S S V V T S G A P R P						
ACTTTTACTGGCACGTCTGGGTTGATATAACATCTGCTGGTACAACACACCTGCAGTT						140
121 T F T G T S G F D I T S A G T T T P A V						
TTGGATATCACACCTTCGTCTACCTCTGTTCTATTCCACAAACCAATTACCAATCCT						160
141 L D I T P S S T S V S I S T T N F T N P						
GCATTTCTGATCCGTCCATTATTGAAGTTCCACAAACTGGGGAGGTCTAGGTAATGTA						180
161 A F S D P S I I E V P Q T G E V S G N V						
TTTGTGGTACCCCTACATCTGGAACACATGGGTATGAAGAAATACCTTACAAACATT						200
181 F V G T P T S G T H G Y E E I P L Q T F						
GCTTCTCTGGTACGGGGAGGAACCCTTACAGTAGTACCCCTATGCCACTGTGGCGT						220
201 A S S G T G E E P I S S T P L P T V R R						
GTACCAAGTCCCCCTTACACTAGGGCTACCAACAAGTGTCTGGCTAACCTGAG						240
221 V A G P R L Y S R A Y Q Q V S V A N P E						
TTCTTACACGTCCATCTCTTAATTACCTATGACAACCCGGCTTGAGGCTGTGGAC						260
241 F L T R P S S L I T Y D N P A F E P V D						
ACTACATTAACATTTGAGCCTCGTAGTAATGTTCTGATTGAGATTTATGGATATTATC						280
261 T T L T F E P R S N V P D S D F M D I I						
CGTTTACATAGGCCCTGCTTAACATCCAGGCGTGGTACTGTGCGCTTAGTAGATTAGGT						300
281 R L H R P A L T S R R G T V R F S R L G						
CAAAGGGCAACTATGTTACCCGTAGCGGTACACAAATAGGTGCTAGGGTTCACTTTAT						320
301 Q R A T M F T R S G T Q I G A R V H F Y						

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L2

FIGURE 3 (continued)

970 CATGATATAAGTCCTATTGCACCCCTCCCCAGAATATATTGAAC TGAGCCTTAGTATCT 321 H D I S P I A P S P E Y I E L Q P L V S	990 1000 1010 1020	340
1030 GCCACGGAGGACAATGGCTTGTTGATATATATGCAGATGACATAGACCCCTGCAATGCCT 341 A T E D N G L F D I Y A D D I D P A M P	1040 1050 1060 1070 1080	360
1090 GTACCATCGCGTCCTACTACCTCCTCTGCAGTTCTACATATTGCCACTATATCATCT 361 V P S R P T T S S A V S T Y S P T I S S	1100 1110 1120 1130 1140	380
1150 GCCTCTCCTATAGTAATGTAACGGTCCCTTTAACCTCCTTGGGATGTGCCTGTATAC 381 A S S Y S N V T V P L T S S W D V P V Y	1160 1170 1180 1190 1200	400
1210 ACGGGTCTGATATTACATTACACCTACTACCTCTGTATGCCATTGTATCACCCACA 401 T G P D I T L P P T T S V W P I V S P T	1220 1230 1240 1250 1260	420
1270 GCCCTGCCTCTACACAGTATATTGGTATACATGGTACACATTATTATTGTGCCATTA 421 A P A S T Q Y I G I H G T H Y Y L W P L	1280 1290 1300 1310 1320	440
1330 TATTATTTATTCTAAAAAGCGTAAACGTGTTCCCTATTTTTTGAGATGGCTTGTG 441 Y Y F I P K K R K R V P Y F F A D G F V	1340 1350 1360 1370 1380	460
461 A A *	GCGGCCTAG	463

HPV18

L2

FIGURE 4. Immunoblot of HPV18 L1 protein expressed in yeast cells.

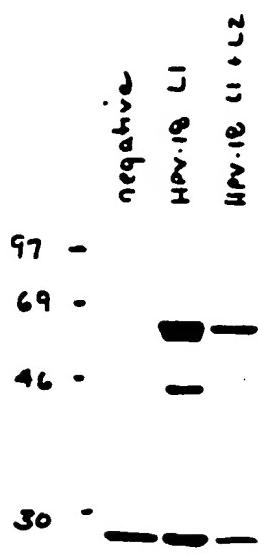


FIGURE 5. Immunoblot of HPV18 L2 protein expressed in yeast cells.

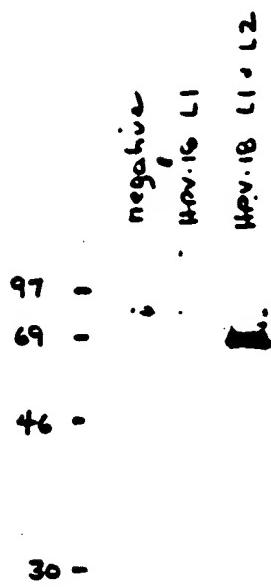


FIGURE 6. Electron micrograph of HPV18 L1 VLPs.



STRUCTURE PROBE

